Overview of 2008 Outer Planet Flagship Studies

Kim Reh

13, 14 February 2008

JPL

Topics

- Background
- Requirements and Ground Rules
- OPF FY08 SOW
  - Common Tasks
  - Mission Specific Tasks
- Key Milestones

Background (1)

- On Dec 23, NASA Planetary Science Division announced that the "Phase-2 studies" for the next Outer Planets Flagship (OPF) will be:
  - Europa Explorer
  - Jupiter System Orbiter
  - Titan Explorer
- These studies will be carried out in cooperation with ESA and JAXA partners in the remainder of FY'08
- The new studies will concentrate on the findings from the technical reviews completed in November 2007. Debriefings on the three studies were concluded on Jan 8, 2008
- Requirements and ground rules and a draft SOW for the 2008 studies were given to JPL and a version 2 of the SOW completed on Jan 15
- The "programmatic changes" required to include international collaborators are being developed

JPL

Background (2)

- On Jan 28, following a NASA-ESA telecon, JPL was informed that the objectives of JSO would be followed into the ESA study
- On Jan 28, NASA announced a program executive for the Outer Planet Flagship studies The NASA POCs are now:
  - Len Dudzinski — Program Executive
  - Curt Niebur — Program Scientist
- On Feb 4, the President's Budget Request for FY09 was released. The budget includes $2.1B for Outer Planets Flagship for launch in 2016 or 2017, depending on the mission target and trajectory
- The final selection of mission target will be made by late FY 2008
- Once the target is selected, an accelerated pre-Phase A effort which leverages the past two years of study will be initiated, culminating in
  - a Mission Concept Review in late 2008 and
  - start of Phase A formulation activities in early 2009

JPL

Requirements and Ground Rules

- NASA mission lifecycle costs are "***capped at $2.1B (FY'07)*** *but that it is acceptable to provide notional international contributions that exceed to $2.1B cost cap*

- *The international contributions must provide capability above the mission science floor and cannot impinge on the ability of NASA to fly a complete mission for $2.1B*

- JPL will "*hold responsibility for conducting all three OPF Phase II studies*" but "*It is expected that JPL will delegate a study and/or portions of studies to outside institutions such as other NASA centers and APL*"

Common Tasks

- Science Instrument AO
  - Assist NASA HQ in the planning and formulation of the anticipated AO for the Science investigations
  - Coordinate drafts of the Proposal Information Package for each study
  - Conduct workshops to educate as necessary the science and instrument community in preparation for the release of the AO

- Launch Approval/Planetary Protection
  - Engage NEPA/Launch Approval office to initiate activities related to potentially launching nuclear material
  - Engage the Planetary Protection office to initiate efforts related to the planetary protection requirements on icy satellite missions

Common Tasks (cont.)

- Cassini Lessons Learned (Note 1)
  - Capture relevant lessons learned from the Cassini team especially in the areas of Phase E cost drivers and operations
- Support International Collaboration
  - Work with NASA HQ and JPL Export Control Offices to prepare Technology Assistance Agreements and ITAR related activities
  - Coordinate interactions with foreign partners as requested by NASA
- Support Science Definition Teams
  - Fund travel expenses for SDT members as well as scientists selected by NASA to support ESA's Cosmic Vision studies

Note 1 Anticipating the intent of this task, the current plan broadens the scope of this to include lessons learned from other missions: eg MESSENGER, MRO

JPL

Mission Specific Tasks

- Europa Explorer
  - Refine the chemistry science objective especially in relation to habitability (Form A)
- Jupiter System Observer
  - Refine the tour trajectory to increase daylight coverage of Jupiter and improving satellite science (Form A and B)
  - Investigate possibility of escaping elliptical Ganymede orbit and continuing with the tour science – perhaps even orbiting another target (Form A)
  - Refine the science objectives, investigations and measurements for Jupiter atmospheric science (Form A)
- Europa Explorer and Jupiter System Observer
  - Perform analyses concerning radiation induced effects on instrument measurement quality and mitigation strategies (Form B)
  - Investigate opportunities for international partnerships within the $1B for contributions (e.g., deploying and supporting a mission element(s) independent of the orbiter and adjusting the tour design)
  - Design and characterize the sensitivity to the design point of a 60 day orbital mission in terms of cost, mass, science return and other factors

Mission Specific Tasks (cont.)

- Europa Explorer and Jupiter System Observer (cont.)
  - Refine radiation plan in 2007 report endorsed by TMC panel in response to radiation findings on Forms B and C
  - Execute the revised radiation plan including:
    - Establishment of all acceptable radiation related lifetime or performance criteria
    - Demonstration of the ability to reach these goals on representative parts including detectors
  - Develop a specific Preferred Parts list for all hardware and permit only highly justified and well mitigated exceptions

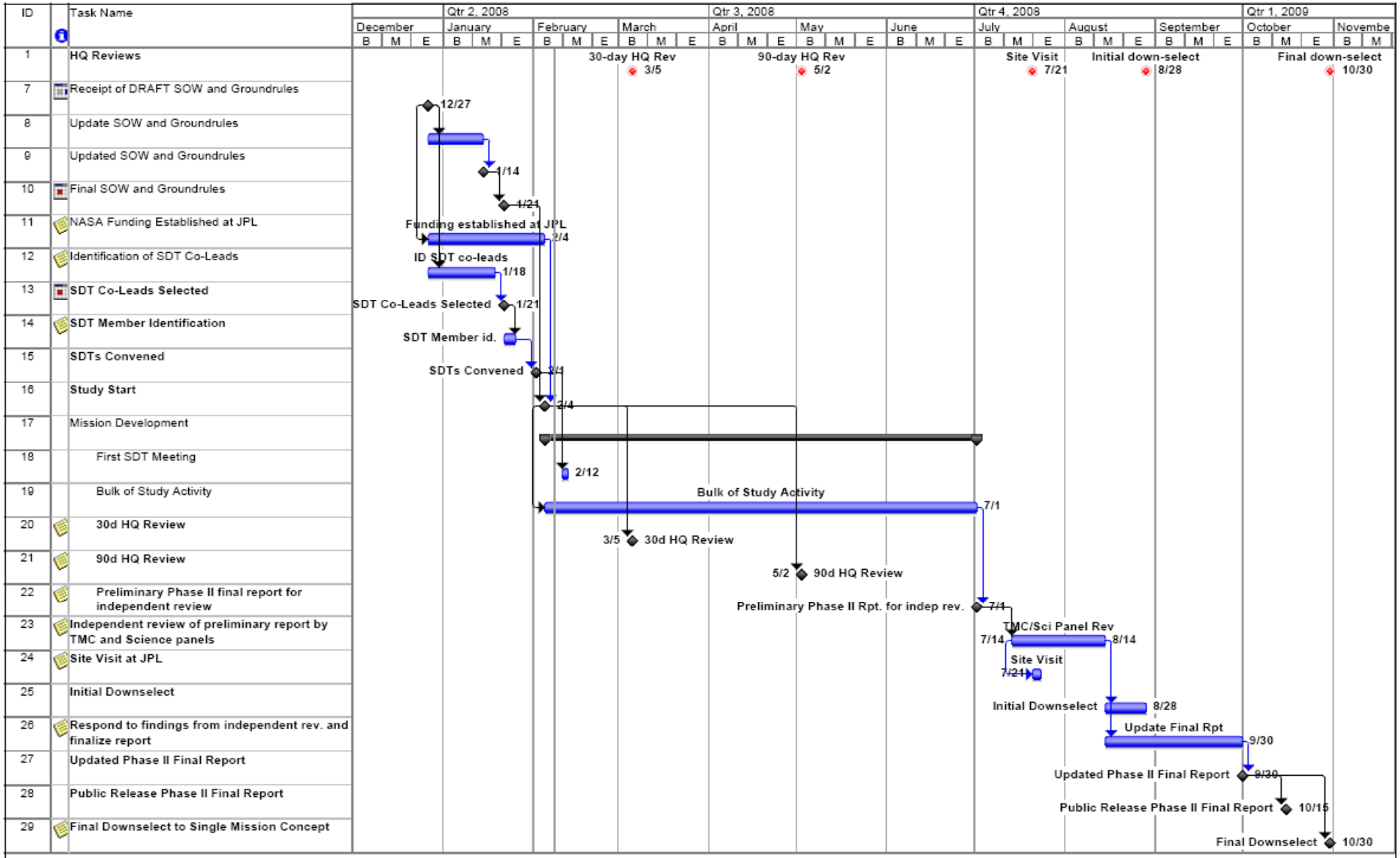
- Titan Explorer
  - Investigate and propose a non-aerocapture architecture
  - Refine the science objectives, investigations, measurements and payload in terms of an orbiter only mission (Forms A, B)
  - Refine payload packaging and articulation (Forms B, C)
  - Address the capability of delivering and supporting a Titan in situ vehicle that can be afforded in the $2.1B cost cap or contributed by an international partner

Key Milestones

- Develop detailed study plan
  - Planning initiated……..….Jan 23, 2008
  - Budgetary plans completed……...……...Feb 7, 2008
- Science Definition Team
  - SDT community leads identified……..….Jan 17, 2008
  - SDT JPL co leads identified……..……..…...Feb 11, 2008
  - SDT selection telecon……..……Feb 15, 2008
  - First Europa SDT meeting……...….Feb 27-29
  - First Titan SDT meeting (tentative)……..…Feb 21-22
- NASA study reporting
  - Formal study start…….……*Feb 4, 2008
  - 30 day report to Alan Stern……..….Mar 5, 2008
  - 90 day report to Alan Stern……May 2, 2008
  - Preliminary Final Report for independent review…..……Jul 1, 2008
  - Final Report……Sep 30, 2008

NASA Final selection of mission target ~ Oct 30, 2008

*Likely change to 11 Feb



Project: OPF Study Schedule 2008v5
Date: Fri 2/8/08, krr

Task		Milestone		External Tasks	
Split		Summary		External Milestone	
Progress		Project Summary		Deadline	